

CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Currently Amended) A method for producing a piezoelectric component containing at least two stacked crystal filters, comprising the following steps:
 - a) providing a substrate;
 - b) producing at least one bottom electrode on the substrate from a first electrically conductive layer applied on the substrate;
 - c) applying a layer stack on the substrate at least in ~~the a~~ region of the bottom electrode, in which the layer stack comprises, beginning with the bottommost layer, a first piezoelectric layer, a second electrically conductive layer, a second piezoelectric layer and a third electrically conductive layer;
 - d) patterning only producing at least a first opening in the third electrically conductive layer and, ~~if appropriate,~~ the second piezoelectric layer to provide a contact hole for the second electrically conductive layer, and producing second openings in at least the third electrically conductive layer in such a way so that at least two stacked crystal filters are produced;
 - e) contact-connecting the third electrically conductive layer.
2. (Canceled) The method as claimed in claim 1, wherein at least one opening is produced in the second piezoelectric layer and, in addition, the second electrically conductive layer is contact-connected.
3. (Withdrawn) The method as claimed in claim 1, wherein, before step e), the resonant frequency of at least one of the stacked crystal filters produced is measured and, if appropriate, in a further step, the layer thickness of the third electrically conductive layer is corrected by local etching-away.

4. (Withdrawn)The method as claimed in claim 1, wherein, before step d) and/or e), at least one upper acoustic mirror is produced, preferably from a layer stack applied on the third electrically conductive layer, the layer stack having at least one layer made of an electrically conductive metal and preferably all the layers of the layer stack being electrically conductive.
5. (Withdrawn)The method as claimed in claim 4, wherein the upper acoustic mirror comprises a layer sequence of electrically conductive metals which alternately have a high and low acoustic impedance.
6. (Withdrawn)The method as claimed in claim 1, wherein the first and second piezoelectric layer have different layer thicknesses.
7. (Withdrawn)The method as claimed in claim 1, wherein, before step b), a lower acoustic mirror is produced in the substrate.
8. (Withdrawn)The method as claimed in claim 7, wherein the lower acoustic mirror comprises a lower sequence made of materials having alternately a high and a low acoustic impedance.
9. (Withdrawn)The method as claimed in claim 1, wherein the bottom electrode, the first piezoelectric layer, the central electrode, the second piezoelectric layer and the top electrode are deposited in such a way that the layer stack formed from these layers has a layer thickness which corresponds approximately to half the wavelength of the mechanical oscillation of the stacked crystal filters.

10. (Withdrawn)A piezoelectric component comprising at least two stacked crystal filters on a substrate, each stacked crystal filter comprising at least one bottom electrode, a first piezoelectric layer arranged above the bottom electrode, a central electrode arranged above the first piezoelectric layer, a second piezoelectric layer arranged above the central electrode, and a top electrode arranged above the second piezoelectric layer, wherein at least two of the respective bottom and of the respective central electrodes of the stacked crystal filters are directly connected to one another.
11. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the bottom electrodes are ungrounded.
12. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the electrical potential of the bottom electrodes is not defined.
13. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the bottom electrodes of at least two stacked crystal filters which are directly connected to one another and their respective direct connection are formed from one layer.
14. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the central electrodes of at least two stacked crystal filters which are directly connected to one another and their respective direct connection are formed from one layer.
15. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the top electrodes of the stacked crystal filters, which are directly connected to one another via their bottom electrodes are used as signal input or signal output.
16. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one lower acoustic mirror.
17. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein at least one upper acoustic mirror is arranged above the top electrodes.

18. (Withdrawn)The piezoelectric component as claimed in claim 17, wherein the upper acoustic mirror is formed from at least one electrically conductive material.

19. (Withdrawn)The piezoelectric component as claimed in claim 18, wherein the upper acoustic mirror is directly conductively connected to the top electrodes.

20. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one contact hole, which extends through the top electrode and the upper piezoelectric layer and via which the central electrode can be connected to a predetermined potential by means of at least one electrically conductive material.

21. (Withdrawn)The piezoelectric component as claimed in claim 20, wherein the same electrically conductive material is used for connecting the central electrode to the predetermined potential as for forming the upper acoustic mirror.

22. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one two-stage single-ended narrowband filter, comprising a first stacked crystal filter, the top electrode of which is connected as signal input, a second stacked crystal filter, the top electrode of which is connected as signal output, the central electrodes being grounded.

23. (Withdrawn)The piezoelectric component as claimed in claim 22, wherein the piezoelectric component comprises at least two series-connected two-stage single-ended narrowband filters.

24. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one impedance transformer, comprising a first stacked crystal filter, the top electrode of which is connected as signal input, a second stacked crystal filter, the top electrode of which is connected as signal output, the central electrodes of the stacked crystal filters being grounded, and the impedance of the first stacked crystal filter being less than the impedance of the second stacked crystal filter.

25. (Withdrawn)The piezoelectric component as claimed in claim 24, wherein, in the first and second stacked crystal filters, the first piezoelectric layer is thinner than the second piezoelectric layer.

26. (Withdrawn)The piezoelectric component as claimed in claim 24, wherein the bottom and the top electrodes have a different areal form and/or areal content.

27. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one power divider, comprising at least a first, second and third stacked crystal filter, the top electrode of the first stacked crystal filter being connected as signal input and the top electrodes of the second and third stacked crystal filters in each case being connected as signal output, the bottom electrodes and the central electrodes of the first, second and third stacked crystal filters being directly connected to one another and the central electrodes being grounded.

28. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one balanced filter, comprising four stacked crystal filters, the central electrodes of which are directly connected to one another and the bottom electrodes of each two stacked crystal filters are directly connected to one another, thereby forming two stacked crystal filter pairs, and, in each stacked crystal filter pair, one top electrode is connected as signal input and one top electrode is connected as signal output.

29. (Withdrawn)The piezoelectric component as claimed in claim 28, wherein the central electrodes are grounded.

30. (Withdrawn)The piezoelectric component as claimed in claim 10, wherein, in at least one of the stacked crystal filters of the component, the first electrode, the first piezoelectric layer, the central electrode, the second piezoelectric layer and the top electrode form a layer stack, whose layer thickness corresponds approximately to half the wavelength of the mechanical oscillation of the stacked crystal filter.

31. (NEW)The method as claimed in claim 1, wherein, before step e), the resonant frequency of at least one of the stacked crystal filters produced is measured and in case correction of the resonant frequency is required in a further step, the layer thickness of the third electrically conductive layer is corrected by local etching-away.

32. (NEW)The method as claimed in claim 1, wherein, before step d) and/or e), at least one upper acoustic mirror is produced.

33. (NEW)The method as claimed in claim 32, wherein the upper acoustic mirror comprises a layer stack applied on the third electrically conductive layer, the layer stack having at least one layer made of an electrically conductive metal.

34. (NEW) The method as claimed in claim 33, wherein the at least one layer made of an electrically conductive metal fills the contact hole.

35. (NEW) The method as claimed in claim 33, wherein all the layers of the layer stack are electrically conductive.

36. (NEW)The method as claimed in claim 35, wherein the upper acoustic mirror comprises a layer sequence of electrically conductive metals which alternately have a high and low acoustic impedance.

37. (NEW)The method as claimed in claim 1, wherein the first and second piezoelectric layer have different layer thicknesses.

38. (NEW)The method as claimed in claim 1, wherein, before step b), a lower acoustic mirror is produced in the substrate.

39. (NEW)The method as claimed in claim 38, wherein the lower acoustic mirror comprises a lower sequence made of materials having alternately a high and a low acoustic impedance.

40. (NEW)The method as claimed in claim 1, wherein the bottom electrode, the first piezoelectric layer, the central electrode, the second piezoelectric layer and the top electrode are deposited in such a way that the layer stack formed from these layers has a layer thickness which corresponds approximately to half the wavelength of the mechanical oscillation of the stacked crystal filters.